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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,433	12/27/2001	Satoshi Arakawa	Q66574	1567

7590 12/12/2007

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EXAMINER	
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ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
12/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/026,433	ARAKAWA, SATOSHI	
	Examiner	Art Unit	
	Anthony Mackowey	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 4,6,8,9,11-13,15-24 and 26-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 4,6,8,9,11-13,15-24 and 26-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 27 December 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

The amendment received September 4, 2007 have been entered and made of record.

Applicant's arguments filed September 4, 2007 have been fully considered but they are not persuasive.

Regarding arguments presented for claims 6 and 13, Applicant submits Shimura fails to disclose common parameters between the first and second energy subtraction processing. Examiner respectfully disagrees. Referring to Shimura, col. 15, lines 15-57, it can be seen the two subtraction processes use common parameters including: an absorption coefficient with respect to low energy components, an absorption coefficient with respect to high energy components and a bias component.

Regarding arguments presented for claims 26 and 28, Applicant submits "Sones teaches separate filter means for bone and soft tissue. This would only lead to separation of filtering elements by does not necessitate the physical separation of the first and second subtraction elements. The subtraction may still be performed in common apparatus and still take into account the first for the bone and tissue samples." Referring to Sones, Fig. 1 and col. 6, line 25 – col. 7, line 61, it can clearly be seen that the first (40) and second (50) filter and transform means (first and second subtraction elements) are separate circuits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 4, 6, 9/6 and 11-13 and 15-20 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,301,107 to Shimura.

Regarding claim 13, Shimura discloses a radiation image signal processing method (col. 1, lines 7-12), comprising the steps of:

i) performing image position correcting processing for correcting a low energy image signal and/or a high energy image signal such that a position of an image, which is represented by the low energy image signal, and a position of an image, which is represented by a the high energy image signal, coincide with each other, a pair of corrected original image signals being thereby obtained (col. 14, lines 52-65; col. 15, lines 1-14, Shimura teaches position adjustment processing is carried out on the image signals SO1 (low energy image) and SO2 (high energy image) such that the positions of the images coincide with each other.),

ii) performing first energy subtraction processing on the pair of the corrected original image signals (col. 15, lines 15-40; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the bone image signal S1.), and

iii) performing second energy subtraction processing with respect to the low energy image signal and the high energy image signal (col. 15, lines 41-54; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the soft tissue image signal S2.),

wherein the second energy subtraction processing is performed by the utilization of the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing (col. 15, lines 1-54; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing position adjustment processing and then performing the first and second energy subtraction processing. It is clear the first and second energy subtraction processing is performed using the same pair of position adjusted image signals.).

wherein an image position correcting means outputs the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing to a storage means (col. 15, lines 1-14; col. 18, line 60 – col. 19, line 9).

Shimura further discloses a energy subtraction processing means, wherein the first energy subtraction processing and the second energy subtraction processing use common parameters upon the corrected image signals (Fig. 11, col. 14, line 28 – col. 15, line 57, *Shimura discloses an image processing and display apparatus (computer) for performing first and second energy subtraction processing. Regarding common parameters, please see arguments presented above*).

Shimura does not explicitly recite the pair of the corrected original image signals are transferred from the storage means to an energy subtraction processing means when an instruction means outputs an instruction to a control means which controls the energy subtraction processing means such that the energy subtraction processing means performs the second energy

subtraction processing by the utilization of the pair of the corrected original image signals. However, Shimura teaches the image processing is performed on an apparatus including a CPU, floppy disk drive, CRT display and internal memory (Fig. 11; col. 14, lines 28-37), which clearly describe a conventional computer. Shimura clearly teaches the signals are stored in the internal memory (col. 18, line 60 – col. 19, line 9). Transferring data between the internal memory and the CPU for processing is inherent to the functionality of a conventional computer, thus transferring the pair of the corrected original image signals from the internal memory to the processor for energy subtraction processing is inherent to the system taught by Shimura. Also, instructions such as software programs are inherent to the functionality of conventional computers and thus an instruction means outputting instructions to a control means for performing the energy subtraction processing is inherent to the apparatus taught by Shimura.).

Regarding claim 4, Shimura discloses the image position correcting processing is performed on only the high energy image signal (col. 15, lines 1-14, *The reference in essence allows either one to be corrected with respect to the other signal, thus meeting the limitation.*).

Regarding claim 11, Shimura further discloses the image position correcting processing is performed by an image position correcting means which receives the low energy image signal and the high energy image signal from a buffer memory which temporarily stores the low energy image signal and the high energy image signal (col. 14, lines 17 – col. 15, line 14, Shimura teaches the first and second image signals are stored in the internal memory and then position adjustment processing is carried out.).

Regarding claim 12, Shimura further discloses the buffer memory receives the low energy image signal and the high energy image signal from a radiation image recording and readout apparatus (Fig. 11, col. 13, line 33 – col. 14, line 51, Shimura teaches the first and second X-ray images have been stored on stimulable phosphor sheets which are exposed to a laser beam and emit light. The emitted light is converted to electric signals that are sampled and amplified to form the first and second image signals.).

Regarding claim 6, Shimura discloses a radiation image signal processing apparatus (Fig. 11) wherein:

i) image position correcting processing is performed for correcting a low energy image signal and/or a high energy image signal such that a position of an image, which is represented by the low energy image signal, and a position of an image, which is represented by a the high energy image signal, coincide with each other, a pair of corrected original image signals being thereby obtained (col. 14, lines 52-65; col. 15, lines 1-14, Shimura teaches position adjustment processing is carried out on the image signals SO1 (low energy image) and SO2 (high energy image) such that the positions of the images coincide with each other.),

ii) first energy subtraction processing is performed on the pair of the corrected original image signals (col. 15, lines 15-40; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the bone image signal S1.), and

iii) second energy subtraction processing is performed with respect to the low energy image signal and the high energy image signal (col. 15, lines 41-54; Fig. 6, col. 19, lines 3-9;

Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the soft tissue image signal S2.),

the second energy subtraction processing being performed by the utilization of the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing (col. 15, lines 1-54; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing position adjustment processing and then performing the first and second energy subtraction processing. It is clear the first and second energy subtraction processing are performed using the same pair of position adjusted image signals.), said apparatus comprising:

a) energy subtraction processing means for performing the first energy subtraction processing and the second energy subtraction processing (Fig. 11, col. 14, line 17- col. 15, line 57, *Shimura discloses an image processing and display apparatus (computer) for performing first and second energy subtraction processing.*),

b) storage means for storing the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing (col. 14, lines 17-37, col. 18, line 60 – col. 19, line 9, Shimura teaches the apparatus contains internal memory.),

c) instruction means for outputting an instruction for performing the second energy subtraction processing (Although not explicitly reciting an instruction means, the processing and display apparatus taught by Shimura is clearly a conventional computer (Fig. 11; col. 14, lines 17-37). Instructions such as software programs are inherent to the functionality of conventional computers and thus an instruction means for performing the energy subtraction processing is inherent to the apparatus taught by Shimura.), and

d) control means for controlling the common energy subtraction processing means in accordance with the instruction, which has been outputted from the instruction means, such that the common energy subtraction processing means performs the second energy subtraction processing by the utilization of the pair of the corrected original image signals, which have been stored in the storage means (col. 14, lines 17-37, Shimura teaches the image processing and display apparatus includes a CPU.), and

wherein the first energy subtraction processing and the second energy subtraction processing use common parameters applied to the corrected original image signals (col. 15, lines 15-57, *please see arguments presented above regarding common parameters).*

Regarding claim 9/6, Shimura further discloses the image position correcting processing is performed on only the high energy image signal (col. 15, lines 1-14, The reference in essence allows either one to be corrected with respect to the other signal, thus meeting the limitation.).

Regarding claim 15, Shimura further discloses the image position correcting processing is performed by an image position correcting means which receives the low energy image signal and the high energy image signal from a buffer memory which temporarily stores the low energy image signal and the high energy image signal (col. 14, lines 17 – col. 15, line 14, Shimura teaches the first and second image signals are stored in the internal memory and then position adjustment processing is carried out.).

Regarding claim 16, Shimura further discloses the buffer memory receives the low energy image signal and the high energy image signal from a radiation image recording and read-out apparatus (Fig. 11, col. 13, line 33 – col. 14, line 51, Shimura teaches the first and second X-ray images have been stored on stimulable phosphor sheets which are exposed to a laser beam and emit light. The emitted light is converted to electric signals that are sampled and amplified to form the first and second image signals.).

Regarding claim 17, Shimura further discloses an image position correcting means output the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing to a storage means (col. 15, lines 1-14; col. 18, line 60 – col. 19, line 9).

Shimura does not explicitly recite the pair of the corrected original image signals are transferred from the storage means to the energy subtraction processing means when an instruction means outputs an instruction to a control means which controls the energy subtraction processing means such that the energy subtraction processing means performs the second energy subtraction processing by the utilization of the pair of the corrected original image signals. However, Shimura teaches the image processing is performed on an apparatus including a CPU, floppy disk drive, CRT display and internal memory (Fig. 11; col. 14, lines 28-37), which clearly describe a conventional computer. Shimura clearly teaches the signals are stored in the internal memory (col. 18, line 60 – col. 19, line 9). Transferring data between the internal memory and the CPU for processing is inherent to the functionality of a conventional computer, thus transferring the pair of the corrected original image signals from the internal memory to the

processor for energy subtraction processing is inherent to the system taught by Shimura. Also, instructions such as software programs are inherent to the functionality of conventional computers and thus an instruction means outputting instructions to a control means for performing the energy subtraction processing is inherent to the apparatus taught by Shimura.).

Regarding claim 18, Shimura further discloses an image position correcting means outputs the pair of the corrected original image signals, which have been stored in the storage means to the energy subtraction processing means for performing the second energy subtraction processing (Fig. 11; col. 14, line 28 – col. 15, line 50; col. 18, line 60 – col. 19, line 9, Shimura teaches position adjustment of the image signals and the image processing and display apparatus performs the first and second energy subtraction processing using the image signals stored in the internal memory.).

Regarding claim 19, Shimura further discloses an image position correcting means outputs the pair of the corrected original image signals to the energy subtraction processing means for performing the first energy subtraction processing (Fig. 11; col. 14, line 28 – col. 15, line 50, Shimura teaches position adjustment of the image signals and the image processing and display apparatus performs the first and second energy subtraction processing using the image signals.).

Regarding claim 20, wherein a buffer memory receives the low energy image signal and the high energy image signal from a radiation image recording and read-out apparatus (Fig. 11,

col. 13, line 33 – col. 14, line 51, Shimura teaches the first and second X-ray images have been stored on stimulable phosphor sheets which are exposed to a laser beam and emit light. The emitted light is converted to electric signals that are sampled and amplified to form the first and second image signals.), and

wherein the buffer memory outputs the low energy image signal and the high energy image signal to an image position correcting means which performs the image position correcting processing (col. 14, line 66 – col. 15, line 14, Shimura teaches the image signals are read from the internal memory and position adjustment processing is carried out.).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimura in view of USPN 4,449,195 to Andrews et al. (Andrews).

Regarding claim 24, Shimura teaches the image processing and displaying apparatus is provided with a keyboard from which instructions are entered, but is silent with regard to the instruction means receives an instruction from the user regarding the second energy subtraction processing prior to outputting the instruction for the second energy subtraction processing.

Andrews teaches if a user desires to perform ad particular fluorographic procedure her or she is simply obliged to have the identification for the procedure fed by way of the CRT terminal keyboard the host CPU. The CPU then assembles the instructions for the procedure (col. 2, lines 43-61). Andrews further discloses the procedures that can be performed include obtaining high and low images (col. 3, lines 23-33) subtracting to obtain bone and soft tissue images (col. 5, lines 13-48). The user input is performed before the image processing begins and can therefore be considered as prior to the outputting of the instructions for the second energy subtraction processing. The teachings of Shimura and Andrews are combinable because they are both concerned with image processing of medical images including energy subtraction to obtain bone and soft tissue images. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus taught by Shimura to receive an instruction from a user regarding the second energy subtraction prior to outputting the instruction for the second energy subtraction processing at taught by Andrews in order to provide the user with control over the procedure to be performed by the system and control over the conditions and timing of the procedure.

Claim 27 rejected under 35 U.S.C. 102(b) as anticipated by Shimura or, in the alternative, under 35 U.S.C. 103(a) as obvious over the combination of Shimura and Sones.

Claim 27 recites, "the first energy subtraction processing provides an observation image, and wherein the second energy subtraction processing provides a second observation image." Provided the broadest reasonable interpretation of "an observation image," the image could be

construed as an image representing (or consisting of) features of interest in the examination. In this case, the soft tissue image (Fig. 9, "47") and the bone image (Fig. 9, "43") clearly identify bone features and soft tissue features. Claim language does not necessitate the observation image be a visibly displayed image.

If, on the other hand, an observation image in construed as a visible image displayed for observation by user, Shimura is silent with regard to displaying soft tissue image"47" and bone image "43" (although Shimura's differentiation between and "image signal" and an "image" may indicate the contrary, see col. 14, lines 28-32). Shimura does teach displaying further processed bone and soft tissue images (col. 22, lines 21-26, 50-54). Sones teaches a display for displaying both the soft tissue image and the bone tissue image (Fig. 1; col. 7, lines 43-45). The teaching of Sones clearly identifies it is well known in the art to display both the bone and soft tissue images on a display for observation by user. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the first and second subtraction processing taught by Shimura to provide observation images (to visibly display the soft tissue and bone images for observation) as taught by Sones in order for the user to evaluate the image subtractions and processing results and to observe both the bone tissue and soft tissue simultaneously.

Claims 8, 9/8/26, 9/26, 21, 22, 23, 26, 31, 33 and 34 are rejected under 35 U.S.C. 103(a) as obvious over the combination of Shimura, Sones and Andrews.

Regarding claim 26, Shimura discloses a radiation image signal processing apparatus (Fig. 11) wherein:

i) image position correcting processing is performed for correcting a low energy image signal and/or a high energy image signal such that a position of an image, which is represented by the low energy image signal, and a position of an image, which is represented by a the high energy image signal, coincide with each other, a pair of corrected original image signals being thereby obtained (col. 14, lines 52-65; col. 15, lines 1-14, Shimura teaches position adjustment processing is carried out on the image signals SO1 (low energy image) and SO2 (high energy image) such that the positions of the images coincide with each other.),

ii) first energy subtraction processing is performed on the pair of the corrected original image signals (col. 15, lines 15-40; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the bone image signal S1.), and

iii) second energy subtraction processing is performed with respect to the low energy image signal and the high energy image signal (col. 15, lines 41-54; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the soft tissue image signal S2.),

the second energy subtraction processing being performed by the utilization of the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing (col. 15, lines 1-54; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing position adjustment processing and then performing the first and second energy subtraction processing. It is clear the first and second energy subtraction processing are performed using the same pair of position adjusted image signals.), said apparatus comprising:

a) first energy subtraction processing means for performing the first energy subtraction processing (Fig. 11, col. 14, lines 17- col. 15, line 35), Shimura discloses an image processing and display apparatus (computer) for performing the first energy subtraction processing.),

b) second energy subtraction processing means for performing the second energy subtraction processing (Fig. 11, col. 14, lines 17- col. 15, line 50, Shimura teaches an image processing and display apparatus for performing the second energy subtraction processing. Current claim language does not exclude the first and second energy subtraction processing means from being the same.),

c) storage means for storing the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing (col. 14, lines 17-37, col. 18, line 60 – col. 19, line 9, Shimura teaches the image processing and display apparatus contains internal memory.),

d) instruction means for outputting an instruction for performing the second energy subtraction processing (Although not explicitly reciting an instruction means, the processing and display apparatus taught by Shimura is clearly a conventional computer (Fig. 11; col. 14, lines 17-37). Instructions such as software programs are inherent to the functionality of conventional computers and thus an instruction means for performing the energy subtraction processing is inherent to the apparatus taught by Shimura.), and

e) control means for controlling the second energy subtraction processing means in accordance with the instruction, which has been outputted from the instruction means, such that the second energy subtraction processing means performs the second energy subtraction

processing by the utilization of the pair of the corrected original image signals, which have been stored in the storage means (col. 14, lines 17-37, Shimura teaches the image processing and display apparatus includes a CPU.).

Shimura is silent with regard to the first energy subtraction processing means and the second energy subtraction processing means being physically separated. However, Sones teaches a first material specific image filter and transform means to obtain a soft tissue specific image and a second material specific image filter and transform means to obtain a bone selective image which are physically separated (Fig. 1; col. 6, line 25 – col. 7, line 61). The teachings of Shimura and Sones are combinable because they are both concerned with image processing or medical images, specifically, obtaining bone and soft tissue images. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the system taught by Shimura to implement the first and second energy subtraction processing means physically separated as taught by Sones in order have the filter functions uniquely adapted to selected material for the material specific image to be generated resulting in enhanced electronic images and reduced noise degradation (col. 4, lines 23-32; col. 7, lines 36-39).

Shimura teaches the image processing and displaying apparatus is provided with a keyboard from which instructions are entered, but is silent with regard to the instruction means receives an instruction from the user regarding the second energy subtraction processing prior to outputting the instruction for the second energy subtraction processing. Andrews teaches if a user desires to perform ad particular fluorographic procedure her or she is simply obliged to have the identification for the procedure fed by way of the CRT terminal keyboard the host CPU. The CPU then assembles the instructions for the procedure (col. 2, lines 43-61). Andrews further

discloses the procedures that can be performed include obtaining high and low images (col. 3, lines 23-33) subtracting to obtain bone and soft tissue images (col. 5, lines 13-48). The user input is performed before the image processing begins and can therefore be considered as prior to the outputting of the instructions for the second energy subtraction processing. The teachings of Shimura and Andrews are combinable because they are both concerned with image processing of medical images including energy subtraction to obtain bone and soft tissue images. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus taught by Shimura to receive an instruction from a user regarding the second energy subtraction prior to outputting the instruction for the second energy subtraction processing at taught by Andrews in order to provide the user with control over the procedure to be performed by the system and control over the conditions and timing of the procedure.

Regarding claim 8, Shimura further discloses the apparatus comprises:

first energy subtraction processing means for performing the first energy subtraction processing (Fig. 11, col. 14, lines 17- col. 15, line 35), Shimura discloses an image processing and display apparatus (computer) for performing the first energy subtraction processing.),

second energy subtraction processing means for performing the second energy subtraction processing (Fig. 11, col. 14, lines 17- col. 15, line 50, Shimura teaches an image processing and display apparatus for performing the second energy subtraction processing. Current claim language does not exclude the first and second energy subtraction processing means from being the same.),

instruction means for outputting an instruction for performing the second energy subtraction processing (Although not explicitly reciting an instruction means, the processing and display apparatus taught by Shimura is clearly a conventional computer (Fig. 11; col. 14, lines 17-37). Instructions such as software programs are inherent to the functionality of conventional computers and thus an instruction means for performing the energy subtraction processing is inherent to the apparatus taught by Shimura.), and

control means for transferring the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing, to the second energy subtraction processing means, and controlling the second energy subtraction processing means in accordance with the instruction, which has been outputted from the instruction means, such that the second energy subtraction processing means performs the second energy subtraction processing by the utilization of the pair of the corrected original image signals, which have thus been transferred (col. 14, lines 17-37, Shimura teaches the image processing and display apparatus includes a CPU.). Shimura teaches the image processing is performed on an apparatus including a CPU, floppy disk drive, CRT display and internal memory (Fig. 11; col. 14, lines 28-37), which clearly describe a conventional computer. Shimura clearly teaches the signals are stored in the internal memory (col. 18, line 60 – col. 19, line 9). Transferring data between the internal memory and the CPU for processing is inherent to the functionality of a conventional computer, thus the control means for transferring the pair of the corrected original image signals from the internal memory to the processor for energy subtraction processing is inherent to the system taught by Shimura.

Regarding claims 9/26 and 9/8/26, Shimura further discloses the image position correcting processing is performed on only the high energy image signal (col. 15, lines 1-14, The reference in essence allows either one to be corrected with respect to the other signal, thus meeting the limitation.).

Regarding claim 21, Shimura further discloses an image position correcting means outputs the pair of the corrected original image signals to a storage means, and to the first energy subtraction processing means generates an energy subtraction image signal by utilizing the pair of the corrected original image signals received from the image position correcting means (col. 15, lines 1-35; col. 18, line 60 – col. 19, line 9, Shimura discloses image position adjustment processing and performing energy subtraction using the first and second image signals stored in the internal memory.).

Regarding claim 22, Shimura does not disclose an image position correcting means outputs the pair of the corrected original image signals to a signal transfer cable, the signal transfer cable transfers the pair of the corrected original image signals to a filing device which stores the pair of the corrected original image signals. The Examiner takes Official Notice that signal transfer cables and filing devices (an example being a hard disk drive), are well known in the art of image processing utilizing computers such as the apparatus taught by Shimura. Signal transfer cables such as those connecting a hard disk drive to the other components of the computer are well known and would have been obvious to one of ordinary skill in the art in order to store the images on a hard disk drive providing safe and stable storage as well providing as a

large storage capacity which may be needed for large images of X-ray images such as those produced by the invention of Shimura.

Regarding claim 23, Shimura teaches the buffer memory outputs the pair of the corrected original image signals to the second energy subtraction processing means which generates an energy subtraction image signal by utilizing the pair of the corrected original image signals (col. 18, line 60 – col. 19, line 9).

Shimura does not disclose a filing device output the pair of the corrected original image signals to a signal transfer cable which transfers the pair of the corrected original image signals to a buffer memory. The Examiner takes Official Notice that signal transfer cables and filing devices (an example being a hard disk drive), are well known in the art of image processing utilizing computers such as the apparatus taught by Shimura. Signal transfer cables such as those connecting a hard disk drive to the memory of a computer are well known and would have been obvious to one of ordinary skill in the art in as storage on the hard disk drive provides safe and stable storage as well providing as a large storage capacity thus reducing the amount of buffer memory required as it only needs to store images currently to be processed.

Regarding claim 31, Sones discloses the storage means communicates with at least one of the first site and the second site via at least one of a network signal transfer cable running between processing devices, an optical cable and a wireless connection (Fig. 1, see connections between high energy image memory and low energy image memory and filter and transform

means (40) and between high energy image memory and low energy image memory and filter and transform means 50).

Regarding claims 33 and 34, Sones further discloses the second site corresponds to a workstation physically separated from the first site (Fig. 1, *the separate filter and transform means output to separate memory and two separate displays device housed within display 60 and may therefore be reasonably construed as physically separate workstations*).

Claims 28, 29, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Shimura and Sones.

Regarding claim 28, Shimura discloses a radiation image signal processing apparatus (Fig. 11) wherein:

i) image position correcting processing is performed for correcting a low energy image signal and/or a high energy image signal, such that a position of an image, which is represented by the low energy image signal, and a position of an image, which is represented by the high energy image signal, coincide with each other, a pair of corrected original image signals being thereby obtained (col. 14, lines 52-65; col. 15, lines 1-14, Shimura teaches position adjustment processing is carried out on the image signals SO1 (low energy image) and SO2 (high energy image) such that the positions of the images coincide with each other.),

ii) first energy subtraction processing is performed on the pair of the corrected original image signals (col. 15, lines 15-40; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the bone image signal S1.), and

iii) second energy subtraction processing is performed with respect to the low energy image signal and the high energy image signal (col. 15, lines 41-54; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing energy subtraction to produce the soft tissue image signal S2.), and

the second energy subtraction processing being performed by the utilization of the pair of the corrected original image signals, which have been obtained at the time of the first energy subtraction processing (col. 15, lines 1-54; Fig. 6, col. 19, lines 3-9; Fig. 9, col. 23, lines 17-39, Shimura teaches performing position adjustment processing and then performing the first and second energy subtraction processing. It is clear the first and second energy subtraction processing are performed using the same pair of position adjusted image signals.).

Shimura does not disclose the corrected image signals are sent to a first site during first energy subtraction processing and the corrected image signals are sent to a second site during the second energy subtraction processing. However, Sones teaches high and low energy images are sent from memory to a first material specific image filter and transform means (first site) to obtain a soft tissue specific image and to a physically separate second material specific image filter and transform means (second site) to obtain a bone selective image (Fig. 1; col. 6, line 25 – col. 7, line 61). The teachings of Shimura and Sones are combinable because they are both concerned with image processing or medical images, specifically, obtaining bone and soft tissue images. It would have been obvious to one of ordinary skill in the art at the time the invention

was made for the system taught by Shimura to implement the first and second energy subtraction processing as first and second sites as taught by Sones in order have the filter functions uniquely adapted to selected material for the material specific image to be generated resulting in enhanced electronic images and reduced noise degradation (col. 4, lines 23-32; col. 7, lines 36-39).

Regarding claim 29, Sones further discloses the first site corresponds to a physically separate location from said second site (Fig. 1; col. 6, line 25 – col. 7, line 61). The first and second image filter and transform means are clearly shown as physically separated ("40" and "50" as shown in Fig. 1) and therefore do not occupy the same exact space and thus are construed as physically separate locations.

Regarding claim 30, Sones further discloses the second site corresponds to a workstation physically separated from the first site (Fig. 1, *the separate filter and transform means output to separate memory and two separate displays device housed within display 60 and may therefore be reasonably construed as physically separate workstations*).

Regarding claim 32, Sones discloses the storage means communicates with at least one of the first site and the second site via at least one of a network signal transfer cable running between processing devices, an optical cable and a wireless connection (Fig. 1, see connections between high energy image memory and low energy image memory and filter and transform means (40) and between high energy image memory and low energy image memory and filter and transform means 50).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Mackowey whose telephone number is (571) 272-7425. The examiner can normally be reached on M-F 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AM
12/10/07

BRIAN WERNER
SUPERVISORY PATENT EXAMINER